

## CLAIMS

Having thus described the aforementioned invention, I claim:

1. A reduction burr for shaping a patient's dental surface, comprising:

a shank including a first end of an elongated body having a first diameter extended symmetrical about a shank axis to a second end of said shank from which a chamfered rim is angled radially inwards to a second diameter being less than said first diameter;

a curved shoulder extended from said chamfered rim, said curved shoulder having a uniformly decreasing cross-sectional diameter extending to a distal end, said distal end having a circular cross-section being less than said second diameter of said chamfered rim, said curved shoulder and said chamfered rim being aligned axially with said shank axis for balanced rotation; and

a burr rigidly joined at a junction with said shoulder distal end, said burr including a selected body length having a cylindrical cross-section of a third diameter extended to a burr end, said burr body length and burr end having an abrasive surface thereon of a sufficient hardness to cut tooth enamel;

whereby said junction defines a stop for self-limiting a depth of penetration of said burr into the patient's dental surface during rotation of said shank and burr as said curved shoulder and said junction contact adjacent uncut tooth enamel, thereby said rotating burr is readily directed to reduce any selected dental surface of the patient's crown and lateral dental surfaces.

2. The reduction burr of Claim 1 wherein said burr body length extended from said junction to said burr end is between about 0.5 mm to about 2.5 mm.

1 3. The reduction burr of Claim 2 wherein said third diameter of said cylindrical  
2 cross-section of said burr is between about 0.5 mm to about 1.0 mm.

1 4. The reduction burr of Claim 3 wherein said abrasive surface of said burr  
2 body length and burr end includes a coating of diamond powder.

1 5. The reduction burr of Claim 1 wherein said abrasive surface of said burr  
2 body length and burr end includes a carbide coating thereon and having cross-cut  
3 fissures interdisposed along said burr body length surface and burr end.

1 6. The reduction burr of Claim 1 wherein said first diameter is between about  
2 1.5 mm to about 2.0 mm.

1 7. The reduction burr of Claim 1 wherein said second diameter is between  
2 about 1.1 mm to about 1.5 mm and said chamfered rim is angled radially inwards  
3 toward said shank axis at an angle between about 70 degrees to about 80 degrees.

1 8. The reduction burr of Claim 1 wherein said curved shoulder includes a  
2 radius of between about 0.7 mm to about 0.8 mm extended from said chamfered  
3 rim second diameter.

1 9. The reduction burr of Claim 3 wherein said shank includes a marking  
2 specifying said burr body length and/or said third diameter of said burr.

1        10.    A depth cut burr for shaping ossiferous surfaces of a patient's skeleton,  
2        comprising:

3                a shank including a first end and an elongated body having a first diameter,  
4        said elongated body having a second end from which a chamfered rim is angled  
5        radially inwardly to a second diameter less than said first diameter;

6                a curved shoulder extended from said chamfered rim, said curved shoulder  
7        having a uniformly decreasing cross-sectional diameter extending to a distal end,  
8        said distal end having a circular cross-section being less than said second  
9        diameter of said chamfered rim, said curved shoulder and said chamfered rim  
10       being aligned axially with said shank for balanced rotation; and

11               a burr rigidly joined at a junction with said distal end of said curved  
12       shoulder, said burr including a selected body length extended to a distal burr end  
13       and having a cylindrical cross-section of a third diameter less than said second  
14       diameter of said chamfered rim, said burr body length and distal burr end having  
15       an abrasive surface thereon of sufficient hardness to cut ossiferous tissue;

16               whereby said junction defines a stop for a self-limiting depth of penetration  
17       of said burr body length and distal burr end into the patient's ossiferous tissue  
18       during shank rotation as said curved shoulder and said junction are contacted  
19       against adjacent ossiferous surfaces thereby said burr body length and distal burr  
20       end reduces each of selected ossiferous surfaces of the patient's skeleton.

1        11.    The depth cut burr of Claim 10 wherein said selected body length of said  
2        burr from said junction to said distal burr end is selected from a range comprising

3 a length between about 0.5 mm to about 50 mm.

1 12. The depth cut burr of Claim 11 wherein said third diameter of said burr  
2 cylindrical cross-section is between about 0.5 mm to about 6 mm.

1 13. The depth cut burr of Claim 12 wherein said burr body length and distal  
2 burr end are coated with diamond powder.

1 14. The depth cut burr of Claim 12 wherein said burr body length extended to  
2 said distal burr end includes a carbide coating thereon and having cross-cut  
3 fissures interdisposed along said burr body length.

1 15. A method of size reduction to precise depths of enamel portions of a dental  
2 surface, comprising the steps of:

3 providing a reduction burr including an elongated shank extended to a  
4 curved shoulder having a smaller cross-section than said elongated shank, and  
5 having a stop junction formed by a distal burr end joined to said curved shoulder,  
6 said stop junction and said distal burr end having a sufficiently lesser diameter  
7 than said cross-section of said curved shoulder to provide an angled junction  
8 positioned against adjacent enamel portions not impacted by said distal burr end,  
9 thereby limiting the penetration depth of said reduction burr into the dental  
10 surface impacted by said distal burr end;

11 determining the precise depth of size reduction required for the enamel  
12 portions of the dental surface;

13           selecting an appropriate length of a burr end of said reduction burr for  
14           achieving the precise depth of said step of determining, said appropriate length  
15           being measured from said stop junction proximal of said curved shoulder to said  
16           distal burr end of said reduction burr;

17           manipulating said reduction burr against the enamel portions of the dental  
18           surface with resulting penetration of said reduction burr into the enamel portions  
19           being self-limiting by said stop junction disposed against adjacent enamel  
20           portions, whereby viewing by an operator of resulting penetration of said stop  
21           junction and distal burr end is readily accomplished due to said sufficiently lesser  
22           diameter of said stop junction and distal burr end; and

23           reducing the enamel portions impacted by said burr end for said selected  
24           depth in at least one dimension laterally and longitudinally along the dental  
25           surface targeted for size reduction.

1           16.    The method of Claim 15 wherein the enamel portions of the dental surface  
2           targeted for size reduction is selected from a group consisting of a crown enamel  
3           surface, a buccal enamel surface, a lingual enamel surface, and respective lateral  
4           enamel surfaces extending between said buccal and lingual enamel surfaces.

1           17.    The method of Claim 16 wherein said step of reducing further includes:

2           producing a plurality of grooves of said selected depth along the dental  
3           surface targeted for size reduction, said step of producing includes moving said  
4           appropriate length of said burr end laterally across the dental surface being size  
5           reduced with resulting penetration of said reduction burr into the enamel portions

6 being self-limiting by said stop junction disposed against adjacent enamel portions  
7 of the dental surface being size reduced; and

8 connecting said plurality of grooves by manipulating said reduction burr  
9 against the enamel portions between each respective groove, thereby reducing the  
10 dental surface targeted for reduction to the precise depth of reduction provided by  
11 said reduction burr having said appropriate length between said stop junction and  
12 said distal burr end.

1 18. A method of size reduction to precise depths of ossiferous surfaces of a  
2 patient's skeleton, comprising the steps of:

3 providing a reduction burr including an elongated shank extended to a  
4 curved shoulder having a cross-section less than said elongated shank, and  
5 having an angled stop junction formed by a burr end joined to said curved  
6 shoulder, said angled stop junction and said burr end having a sufficiently lesser  
7 diameter than said shoulder cross-section thereby providing said angled stop  
8 junction for positioning against adjacent ossiferous surfaces for limiting the depth  
9 of penetration of said burr end into the ossiferous surfaces;

10 determining a precise depth of reduction for the ossiferous surfaces;

11 selecting an appropriate length of said burr end for achieving the precise  
12 depth of penetration of said step of determining, said appropriate length being  
13 measured from said stop junction at said curved shoulder to a distal portion of  
14 said burr end;

15 manipulating said reduction burr against the ossiferous surfaces with  
16 penetration of said reduction burr into the ossiferous surfaces being self-limiting

17 by said stop junction disposed against adjacent uncut ossiferous surfaces,  
18 whereby during said step of manipulating, said sufficiently lesser diameter of said  
19 stop junction and said burr end allows viewing of said stop junction and periodic  
20 viewing of said burr end during said step of manipulating; and  
21 cutting the ossiferous surfaces impacted by said distal portion of said burr  
22 end for said selected depth in at least one dimension laterally and longitudinally  
23 along the ossiferous surfaces targeted for size reduction.

1 19. The method of Claim 18 wherein the ossiferous surfaces of the patient's  
2 skeleton are selected from a group consisting of skeletal surfaces proximal of a leg,  
3 knee, hip, arm, shoulder, elbow, jaw, and spinal column.

1 20. The method of Claim 16 wherein said step of reducing further includes:  
2 producing a plurality of grooves of said selected depth along the ossiferous  
3 surfaces targeted for size reduction, said step of producing includes moving said  
4 burr end laterally across the ossiferous surfaces being size reduced with resulting  
5 penetration of said reduction burr into the ossiferous surfaces being self-limiting  
6 by said stop junction disposed against adjacent uncut ossiferous surfaces  
7 proximal of the ossiferous surfaces being size reduced; and  
8 connecting said plurality of grooves by manipulating said reduction burr  
9 laterally over the ossiferous surfaces between respective grooves, thereby reducing  
10 the targeted ossiferous surfaces to a depth of reduction provided by said reduction  
11 burr length between said stop junction and said distal portion of said burr end.